Live Steam

THE MONTHLY MAGAZINE FOR ALL LIVE STEAMERS AND LARGE-SCALE MODEL RAILROADERS

OCTOBER
1970

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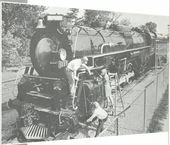

in this issue

A Really Big Hudson
The Startled Fawn
Sundown & Week End Railroad

Live Steam
magazine

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COVER PHOTO

Randy Paquette, Steve Reeves and Charlene Burger of the MSU Railroad Club at Michigan State University at work rebuilding PM 1225 for use on excursions and tours. See story in "...from the cupola."

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...from the cupola

With a "tsk-tsk" tone of voice and a wagging of his head, the commentator on a recent telecast bore the terrible *news* that one out of every six college campuses across our country was closed down by protests!

So, what?

On that very same day, then, *five* out of every six college campuses across our country were operating normally. If, as we are told, only 2% of our students are chronic troublemakers, it figures out that only 0.3% of all students were causing 99% of the "news" that day.

"What does all this have to do with Live Steam," you ask?

In the recent past, we have been approached by two potential Live Steamers with very similar problems. One a college student, the other a recent college graduate (hundreds of miles away) found it impossible to strike up conversations or to even make nodding acquaintances after visiting area club tracks weekend after weekend.

Could it be that we have forgotten that the only place left to get intimately acquainted with Live Steam is through us Live Steamers? Have we become so satisfied with our creations and facilities that we ignore others who would like to share in the fun . . . and the work? Have we been duped by top-heavy news emphasis into thinking that only those with furrowed brow and graying hair are worthy to partake of The Hobby?

If so, *we* will be the loosers. If we (who work in thousandths of an inch) must rely on someone else's calculations to become aware that 98% of our youngsters are the kind of people we really like, then we need to step back and take a good look at the situation.

If you think (as some would have us believe) that our young people's vocabulary is limited to four-letter words, go ahead and try some on them. Try "*Glad* to *meet* you;" "*Ride mine;*" "*Want help?*" You will be the winner with those simple phrases and our Brotherhood of Live Steamers will become the BROTHERHOOD of Live Steamers!

As if to amplify these expressed thoughts (which have been in preparation for quite some time) a letter in last week's mail was most timely: our cover picture on this issue with a press release from Michigan State University telling that there is still vital interest in steam power. Enough interest, in fact, that a group of MSU students has received permission from University President Clifton R. Wharton, Jr., to renovate Pere Marquette Berkshire No. 1225 and put it in operation! The Lima "Super-Power" 2–8–4 was donated to the MSU Museum in 1957 by the Chesapeake & Ohio Railroad. To further assist the Club's efforts, Michigan State Fair officials have authorized the exchange of parts from their PM 1223 (same type and class as the 1225) which is on display in Detroit.

For the benefit of those who didn't notice, we will point out that MSU Railroad Club members didn't stand in front of tv cameras insisting that *you* do something about the 1225. They are part of that 98% of our youngsters that we mentioned before who go about making decisions and getting things done. Quietly. They won't make the networks with this project, but they are Front-Page News here!

To help finance repairs to the 1225, the MSU Railroad Club is starting off by selling chrome-plated railroad spikes at five dollars each. (Send to MSU Railroad Club, % MSU Museum, East Lansing, Michigan 48823) Later it plans to offer other collector's items for sale as well. Let's show them that we are aware of their effort and appreciate their interest in steam by supporting them in their fund drive. We might even extend an offer of assistance in case they run up against a snag – and want to ask for our help. After all, Live Steamers now represent the greatest source of information and experience anywhere on the subject of steam power.

And if four-letter words better suit your vocabulary, we'd like to suggest these to be used with any youngster who shows genuine interest in Live Steam:

TELL THEM, "COME, JOIN."

– W. C. F. –

2¼" scale produces

A REALLY BIG HUDSON

When Lester Turknett began thinking about building a Live Steam locomotive, he wanted something that would be most representative of the age of steam that he remembered. Although he had spent a few weeks firing on the Seaboard and some years in that road's shops, the New York Central's Hudsons that pulled the crack trains between New York and Chicago seemed to be the ultimate in his mind. Firing took a man away from his family too long to suit Lester, so he had transferred to the shops. When the SAL closed their shops, he went into the Flint River Mills where he rose to Mill Foreman in charge of maintenance and production.

He began scaling down the Hudson drawings in the fall of 1958 and by February 1959 he started making the patterns for his 2¼" scale Hudson. Just about every evening he could be found in the mill's shop, working up parts for his engine and by the spring of 1964, the Hudson was operating under steam on blocks. Another year or more was spent in building the tender and applying final detail to the engine so that an inaugural run was made in August of 1965.

350 feet of 10-7/8" gauge track was laid with 12# rail and Lester hopes to extend that some day so that he can really operate the engine! She's built to last – with all journals and side rods running on ball bearings, a total of 52. The side rod bearings are fitted in the rod end with snap rings for easy replacement. Journal boxes are spring on leaf springs and fully equalized. Drive wheels are fitted with steam-activated brakes and the tender trucks are equipped with double clasp brakes.

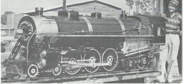
All castings, except the wheels and cylinders are cast steel. The cylinders and valve chambers have cast iron liners while the valve spool, valve rods and piston rods are stainless steel. The wheels are cast iron.

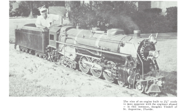
The tender has an inner tank of galvanized 14-gauge steel to prevent rust through the tender body. A mechanical lubricator (2-feed) feeds oil to the cylinders through the throttle valve. Night running is enjoyable with operating head light, number board, classification lights and cab light.

Although retirement is not imminent for Lester, thoughts turn towards that day and possible plans that could include his love for Live Steam. Perhaps it can bring that long, straight track where he can enjoy day after day running that *Really Big Hudson!*

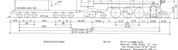
[illegible]

With the August 1965 Inaugural Run a success, builder Lester Turknett is entitled to every inch of that broad grin as he steps back to take another look at the 2¼" Hudson. It's a beauty!





The size of an engine built to 2½" scale is more apparent with the engineer aboard — in this instance, Douglas Tindall of St. Augustine, Florida.


coal
coal
removable water tank
6.75 dia
6.75 dia
9 dia
16.5 dia
5.75 dia
1375
10
10
29.5
10
10
36.275
14.625
17
15.75
15.75
11.5
16.625
12.25
20
20
63.5
31.5
51.25
187.25 inches (15' 5¼")
223.0 inches (18' 7")
24.05
36

SPECIFICATIONS

Builder:	Lester F. Tucknott Bainbridge, Georgia
Date:	Started — 1958 Under Steam — 1964 Completed — 1965
Type:	4-6-4 "Hudson"
Scale:	2½" = 1' 0"
Gauge:	10-7/8"
Prototype:	NYC J-1-d Class Schenectady, 1927
Cylinders:	Bore: 4" Stroke: 5½" Piston Valves: 2½" bore; 1-1/16" travel; 3/16" lap
Valve Gear:	Walschaerts, case hardened links and blocks
Firebox:	Length: 36" Width: 15½" Height: 12" Material: #285 Grade "C" fire-box flange steel, 5/16" thick
Boiler:	Built to ASME Code Material: #285 Grade "C" fire-box flange steel, 5/16" thick Pressure: Designed for 250 psi Safety valves set at 125 psi and 130 psi Tubes: 23 — 1¼" x 53" 4 — 2" x 53" Stays: 53 — ½" with 3/16" telltale holes to meet code. 42 — ⅝" radial 2 — 7/8" longitudinal 1 — hollow
Water Supply:	2 Penberthy injectors, high and low pressure Axle-driven feedwater pump Auxiliary hand pump
Throttle:	Front and multiple poppet type; bronze seats and stainless steel valves
Weight in working order:	Approximately 6,000#
Indicated Horse Power:	16.893
Tractive Effort:	699.537#
Fuel:	Coal

DRILLS AND DRILLING
for the apprentice

by Jack D. McKenty, M.D.

Part 3

Murphy's Law, which should be known to every home machinist, states: "If something can go wrong, it will." Two of the corollaries to Murphy's Law are as follows:

Corollary I – There is no such thing as a straight line.

Proof: Scribe a line along the edge of a rule, on a piece of scrap. Make 6 or 8 center punch marks on it, and drill each mark #30. Lay the edge of the rule along the side of the holes.

Corollary II – Things equal to the same thing are not equal to each other.

Proof: Layout the identical pattern of 6 or 8 holes on each end of a piece of flat stock. Drill all the holes with the #30 drill, cut the piece in half, and using #5 machine screws, try to fasten the two pieces together.

What the foregoing proves is that even with the greatest care, it is not always possible to drill a hole exactly where you want it. And as has already been stated, a drill bit almost invariably drills a hole an unforeseeable amount larger than itself.

A drill is only a roughing tool. It will remove its own weight in metal faster than any other tool, but the holes it makes are off both in size and location. A friend of mine, a tooling engineer, says, "The only requirement for a drilled hole is that you must be able to see through it." He is not quite right. Since *many* of the holes we must make are "blind," (they don't go all the way through the workpiece), the only requirement for a drilled hole is that you must be able to look into it.

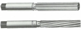
Commercially, these discrepancies in size and location are often allowed for by what is called "slop tolerance." As long as the hole isn't larger than the head of the bolt which is to go into it, the size is of no particular consequence. And the holes are made deliberately oversize so that mating holes will at least approximately line up.

Even this fails sometimes. If you have ever put together a child's swing set or a power lawnmower which arrived half assembled, you have run into some of the failures.

When a hole must be dead to size, something other than a drill must be used to finish it. When the location of the hole is critical, something other than a centerpunch mark must be used to locate it.

Size – the tools

The hand method of accurately finishing a hole to size is done with a "reamer." (See the illustration.) The kind we use are "hand reamers," preferably in high-speed steel, with either straight or spiral flutes. The spiral flutes are more expensive, but straight reamers sometimes chatter and leave polygonal holes, especially if used for too big a cut. The shanks are parallel and there are flats on the end for gripping.



Illustrations courtesy
The Cleveland Twist Drill Co., Cleveland, Ohio

It is not obvious from the illustrations, but the flutes are slightly tapered for about one-quarter of their length. The end of the reamer does no cutting; all metal removal is done by the tapered portion of the flutes. This means they will not size a blind hole.

Other common varities of reamers include "chucking reamers" which have parallel shanks but shorter flutes, and reamers with Morse taper shanks for use in machine tools only.

Sizes range from 1/8" diameter on up by 32nd's. Chucking reamers are also available in number and letter sizes, and are usable as hand reamers in sizes below 1/8".

There are also a bunch of special reamers. Commercial types include taper reamers in Morse, Brown and Sharpe, Jarno, and other machine tool tapers. "Bridge reamers" are a brute-force way of enlarging holes in structural steel works. A small taper reamer is available for deburring pipes, and for enlarging holes in electronic chassis. It has some use in the home workshop as well. "Expansion reamers" are adjustable a few thousandths over or under their nominal size. They are very expensive, but are occasionally needed by modelers for some special purpose, such as rejuvinating a worn cylinder.

Home-made specials include taper reamers but a lathe is needed to make them. "D-bits" can be made without a lathe, and are very useful. Both types will be discussed in detail in a future article.

Reamers are precision tools and must be treated as such. They are costly enough to make careful treatment automatic. A complete set of hand-reamers from 1/8 to 1/2 inch puts your shop in the luxury class, but you will probably have to buy them one or two at a time, as they are needed. Our advertisers carry a good assortment at competative prices.

The reamer is used to size a hole that is only a few thousandths undersize. The preliminary, or pilot hole is drilled using a bit one size smaller than the reamer. Ideally, the pilot hole is large enough to admit about one-third to one-half of the tapered portion of the reamer.

The work should be securely held in the vise. The reamer is held by a suitably sized tap wrench, preferably the adjustable kind rather than the T-handle. A crescent wrench can be used, but the off-center torque applied by the single handle makes it very difficult to keep the tool square with the work.

continued

The techniques:

The reamer and the hole it is going into are both lavishly lubricated with cutting oil, machine oil, or even "rapid-tap" before starting. The reamer is introduced, being careful to keep it square, and turned forward into the work.

Do not feed it forward without turning it or you will get longitudinal scratches in the hole.

Do not turn it without feeding it or you will get cylindrical scratches.

Never turn it backwards or you may wreck the reamer.

After the entire taper portion has been fed through the hole and is sticking out the other side, continue to turn the reamer forward, but reverse the direction of the feed so it comes back out again. Do not try to feed shank and all through the hole. Since the shank is usually identical in size with the flutes, it will be a push fit in the hole.

When it is back out of the hole, clean the flutes with an old tooth brush, re-oil it and put it carefully away.

The turning motion does not have to be continuous; just be careful not to turn without feeding and vise versa. The size of the pilot hole is fairly critical. It may be advisable to drill and ream a preliminary test hole in a piece of scrap, to make sure that the drill bit selected isn't cutting larger than the size of the reamer. I have been caught out on this.

Reaming in the Drill Press:

The reamer is held in the drill chuck, and run at the slowest speed available. The reamer and the hole are both thoroughly lubricated, and it is run right into the hole and back out again. If you "dwell" at any point, cylindrical scratches again!

If possible, it is best to ream immediately after the pilot hole has been drilled, before the workpiece is taken out of the vise, or unclamped from the table. If the work is being returned to the drill press after something else has been done to it, it must be allowed to "float;" it is kept from rotating, but allowed to assume its own position with respect to the reamer.

Smaller pieces, which have to go back in the drill press vise, need a different technique. Put the pilot drill back in the chuck, and place the workpiece back on the drill. (Don't turn the motor on.) Bring the pilot drill, and clamp the vise on the workpiece. Remove the pilot drill and carry on with the reaming. The pilot hole will be close enough to being axial with the reamer to be okay.

Reaming in the Lathe:

While this is technically out of sequence with these articles, it seems a good place to include it.

After drilling the pilot hole using the drill in the tailstock drill chuck, put the reamer in the drill chuck. Run the lathe at its lowest speed, and slather oil all over everything concerned. Do not clamp the tailstock; it must be allowed to float. Slide the whole tailstock so the reamer goes in and back out again, with no dwell.

If the reamer is too large to fit in the tailstock chuck, fasten a wrench on the flats, and butt it against a center point in the tailstock. The back end of the reamer has a center hole for the purpose. Slide the whole tailstock in and out as before, except now one hand has to aim the reamer, prevent it from turning, and keep it against the center point, while the other hand pushes and pulls the tailstock.

If the hole is that large, you should bore it in the first place.

Note: The English sometimes call the whole process "reamering." It's their language, so I suppose we can't complain.

FOR SALE

A Live Steam Locomotive

by R. W. Maynard

Almost every month there are advertisements in LIVE STEAM Magazine listing locomotives for sale and wanted-to-buy. These change almost every issue so it is a fair assumption that an exchange has been made, and the engine has found a new home. In most cases, the new owner is happy with his purchase, but unfortunately, it doesn't always work out well. After several futile attempts to run the engine he begins to get a feeling that all was not as pictured; and a steam engine might not be as easy and as much fun as he first thought, and the fraternity loses another.

Unfortunately, the newcomer to Live Steam is usually in a field that is totally new to him. If he has had previous modeling experience in HO and O gage or other model building, it will help as far as working with tools. But the knowledge gained is in an entirely different field; and the only similarity between Live Steam and the indoor type of railroading is they operate on a metal rail and use flanged wheels. In his desire to really "get into it," the new devotee may overlook a number of important details in the purchase of a locomotive, and later may regret his "instant action." Perhaps we can help with a few simple steps that could be used as a check-off list.

The following remarks are to be used when looking at a cold engine. If you are fortunate enough to be able to test a locomotive before buying, fine, because there can be no argument with success. If the engine performs well, there isn't much else to add, but even then there is a level of good performance. The engine should steam well and hold its operating pressure under all conditions. The safety valve should "pop" at the proper pressure, the engine pump should maintain proper water level, all other parts such as hand pump and lubricator, must function well. If they do not, your run will be short.

The seller has it for sale – you want to buy it – so let's really take a close look. Some information about the quality of an engine can be obtained by the finish it wears. A good finish and good workmanship on the outside usually mean it was carried through from the beginning in this fashion. However, a good paint job put on after the engine has been built can cover many, many sins! Take a close look at the rivet detail. Is it neat and straight, or poorly done? Does the molding around the cab or coal bunker look well-made? Are the hand rails straight and well-aligned and do the cab steps or ladders appear square? Does the cab roof look straight, and does the stack come out of the smokebox and head skyward straight as an arrow, or does it sort of lean to port or starboard? What sort of a finish is on the side rods and valve gear – polished, or quite rough with saw and file marks showing? Does the contour of the side rod look machined or roughly filed to shape? A builder who takes time to make machined rods and polish them to a fine finish is usually a careful builder. How about the fit of the dome casting and the cab around the boiler jacket? A major part of good workmanship can be summed up in alignment fit and finish. Check all sections of the exterior for these.

If your proposed purchase passes most of the points in the preceding paragraph, let's examine the running gear. Are the wheels finished smoothly and turn easily? Do the flanges appear all the same depth and thickness? Driving box and axle bearing wear could have been "built-in," or perhaps it has been arrived at as a natural function. A ¾" scale engine should not exceed .010 to .015 in the boxes and less than .008 in the driving axle. The quartering operation on the wheels may be easily determined by turning them slowly by hand. If the side rods have approximately the same amount of looseness in each 90° position, the quartering and side rod centers are accurate. If alternate tightness and looseness is felt, they are not well-made. It must be noted that if the drive turns easily, excessive clearance in the axle driving boxes and crank pin bearings could be a cover up for a bad quartering job. Note the clearance on the driving boxes – do they move from front to rear as the wheels turn? They should not. Give the cross head guide bars and slides a close look. Is the attachment of the piston rod loose? The clearance between the guide bars and slide should not exceed .010". If it does, it needs attention. The pistons should have a slight drag when the wheels are rotated, a smooth silky feel will indicate a good job. If possible, push the engine forward and backward and listen for the exhaust – if the valves and pistons do fit well then there should be a noticeable "pop" in the stack. If there is no sound – be wary. I know of one fellow who bought a locomotive that had no valves in the steam chests! The turning of the wheels will also give a clue to the mechanical lubricator and water pump. Does the rachet on the lubricator "click" and does its shaft rotate? If not another repair problem, plus the fact the cylinder and pistons may be scoured from a lack of oil. The water pump ram should be slightly polished; if scoured, the unit may be still functional, but another repair job is necessary. If the engine is not under steam, and since you cannot disassemble pumps and check valves, it is almost impossible to ascertain whether they will operate. It is possible for a pump to be well-made and still not operate. Dirt or mineral deposits from water can cause a malfunction; however, it would be necessary to remove the pump, disassemble it, clean all the valve seats. On some engines it may require a complete removal of the boiler from the chassis to get the axle pump from its moorings.

Valve gear parts can be poorly made, or worn, and if they are covered with dirt and grease, it is some indication they could be worn. In most cases, if the clearance on any valve gear part exceeds .015, it is wearing to a degree that is going to affect the performance. On a Walschaerts or Stephenson gear, carefully check the "slop" or clearance of the die block in the eccentric link. The wear of eccentric straps can usually be taken care of easily by filing the caps, but this is the only repair operation that can be easily done. Usually the rebushing of a valve gear is quite time consuming, but a good locomotive that has become worn through use can be made almost as good as new by the process.

The heart of any locomotive is that part that supplies the "punch," the boiler. It must be basically sound, withstand a hydro test of at least 50% above its operating pressure before it can be classed as a safe steam generator, and there must be a number of fittings that work. A good rule to follow – "before you buy, hydro." If a seller will not allow such a test on the locomotive – don't be too trusting. If the engine in question is not complete, running a test might not be easy to do, but if the the engine is supposed to be operable, the coupling up of the tender lines is really the greatest amount of work involved. A hydro test can tell you many things. Does the safety valve work? It should lift at somewhere between 80 PSI and 125 PSI. Most small locomotives do not operate at higher pressure. The operation of the hand pump to get this pressure will also give an indication as to how well the pump will work. Be sure to hold down the safety valve with a block of wood. Water leaks around the fittings are not particularly serious, but leaks and the bowing of plates indicate defects that are not remedied without effort. It is almost always necessary to remove a boiler from the frame, remove its jacket and fittings to effect any major repair, such as a leaking staybolt or a split seam.

If it is impossible to run a hydro test, visual inspection must be relied upon. Unfortunately, most of the actual work on the boiler is usually covered up by the jacket, tanks, cab and paint. The only section showing is the backhead and, if you turn the engine upside down, the firebox. The examination of the firebox should reveal if the boiler has been fired and steamed. If the engine hasn't been fired, look at the staybolts. Has the caulking been done neatly or is the solder just hung on in "globs?" A steel boiler will probably have been caulked with a hammer or brazing. A copper boiler may have silver soldered or soft soldered staybolts. A good job will have a small fillet surrounding the nut or bead of the bolt, a rough solder job may indicate leaks. An examination of the grate will give some indication as to how many firings have taken place. A cast iron grate will show some erosion after two or three years of use. A mild steel grate will be quite rusty after this time, assuming, of course, the engine has normal use. I would say normal use would be between 25 and 75 actual miles of operation each year. Of course, grates do need replacing and a well-run, well-fired locomotive could be sporting a complete new grate.

It is not an easy thing to place the actual worth on a locomotive. While it is quite true that almost anything can be repaired and made to run, you must be willing to put the time or the money into it. But too much repair work rather defeats the purpose of buying a complete, or partially completed engine.

Perhaps these notes will aid you in your purchase. It is sincerely hoped so. Good steaming!

With ideal weather conditions and five engines under steam, the seventy who attended Dave Boyd's meet in Clarendon Hills, Illinois, on May 24th couldn't have wished for a better time!

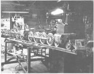
Howard Miller and Harold Wood (1, l to r) visit with Oakley Little as he steams up his ½'' scale B&A 4-6-6T. Milton Snyder's 1'' 2-6-4T engine (2) was a newcomer to the track and performed well for its builder.

In spite of the fine weather, there was much traffic into Dave's basement to check progress on his 1½'' "Big Boy" (3) and look at the Brown & Sharpe end mill and 15'' Premius lathe which were acquired during the past winter.

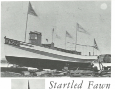
Nick Schaub and Russ Decho (4) doubleheaded with a long string of cars and their 1'' 0-6-0 and 2-6-0 made beautiful music together. Doc Mann, resplendent in a Japanese engineer's cap, (5) took care of many eager passengers at the meet with Dave Boyd's 1'' 4-6-2, while Howard Miller (1) looked over Nick Schaub's 1'' 0-6-0 (6) at a "station stop."

So another Live Steam season got a good send-off as happens each spring when Live Steamers from Northern Illinois meet to run on Dave Boyd's

SUNDOWN & WEEK END RAILROAD



PHOTOS BY DAVE BOYD



Startled Fawn

by Richard M. Mitchell

This 26-knot, 71' steamer was built at Philadelphia in 1876 by Charles Holman for the express purpose of winning the boat race in the coming centennial exposition. Her machinery consisted of a marine Scotch boiler and two high-pressure reciprocating engines hooked up in multiple on the same crank shaft. This power plant developed 70 horsepower and was built by Mason and Levy.

She was brought to the Merrimac River in Massachusetts in 1879 where she was used between Haverhill and Lawrence and also coastal ports between Boston and Portsmouth. Although she was sponsoned to give more deck room and greater stability, she was pretty lively and rolled quite a lot, especially when crossing the bar at the mouth of the river.

Startled Fawn had an uneventful and prosperous career running to and from the landings and waterside parks between Lawrence and Lowell until 1891. In August of that year, her steering cable broke while she was making the turn above the dam. The excited pilot grabbed the wrong bell pull and the engineer, hearing the jingle, opened her up and the resulting burst of speed drove the little vessel right over a log boom, after which she smacked a pile cluster and sunk in 10' of water at the canal entrance.

She was raised and was soon running again. But through no fault of her own the changing times had begun to overtake her. The little fleet of steamers was fighting a losing battle with the then novel and newfangled method of transportation, the electric trolley car.

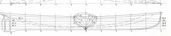
Although the *Fawn* was as fast or faster than the trolley car, as was demonstrated at every stretch along the shore where the tracks followed the river, the passenger traffic moved slowly but inevitably from the river to the shore. The boats continued to run but their money-making days were over. In 1896, the fast hull of the *Fawn* was waterborne for the last time.

Forced into idleness while still in her prime, her engines were taken to Lubec, Maine, to be used as power for a marine railway. For those who know the upper Merrimac, the Jersey Ice Cream Company's location is hallowed ground of the *Startled Fawn*. Here lies her bones.

The "Startled Fawn's" white stack blends into the light sky of these old-time photos, but it extends just above the whistle which can be seen clearly.

Lines for the hull of the "Startled Fawn" were provided by Prof. Evers Burtner, taken from a model which still exists.

PHOTOS FROM THE ARTHUR HUGHES COLLECTION



SOUTHERN - LIVE STEAM COMPETITION

Prototype offers interesting variations

The Southern's Ps-4 class included engines other than the three number groupings listed with the diagram shown in the August issue of LIVE STEAM Magazine.

That particular group which was built by Richmond in 1926 included 22 engines, assigned as follows:

Southern 1393–1404
CNO&TP 6476–6482
AGS 6688–6691

These were the first of the Southern's engines to be delivered with the green and gold color scheme. They had 14,000 gallon – 16 ton tenders on six-wheel trucks and Elesco feed water heaters, and were basically the same as a previous series built by Schenectady in 1923. These engines were originally equipped with Baker Valve Gear but were converted to Walschaerts Valve Gear as they were shopped between 1933 and 1936.

The original group of 36 Ps-4's, were a bit lighter, had Worthington Type BL feed water heaters and 10,000 gallon – 16 ton tenders on four-wheel trucks. These were numbered as follows:

Southern 1366–1392
CNO&TP 6471–6475
AGS 6684–6687

Although the Erection Drawings and the diagram furnished apply to the "middle" group of Ps-4's, many of the detail drawings which follow also are applicable to the other groups of the series. The MAIN FRAME drawing this month is a case in point, and the engines that it covers are shown in the drawing title block.

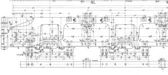
In 1928, the Southern ordered another five engines from the Baldwin Locomotive Works and they were designated:

Southern 1405–1409

These engines were equipped with 12,000 gallon tenders on four-wheel trucks and had Walschaerts Valve Gear as original equipment. Four of the engines had Worthington feed water heaters, but the 1409 was provided with an elongated smokebox and the Coffin feed water heater.

The variety, then, is infinite in the Ps-4 class. Baker or Walschaerts Valve Gear is authentic; Elesco, Worthington or Coffin feed water heaters were used; four- or six-wheel tenders are "prototype" and some engines had, at different times, tenders of both styles.

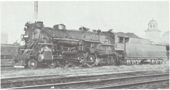
Drawings for both valve gears will be included in the material presented in LIVE STEAM Magazine so that either design will be acceptable. Wherever the details apply to various groups, all the engine numbers will be included in the title block.



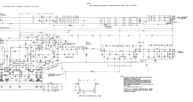
MAIN FRAME

SOUTHERN RAILWAY SYSTEM
Washington, D. C., July 17, 1924
Revision "Y" March 23, 1945
Revision "Z" July 19, 1926

Drawing SL-6104
Engines 1366–1404, 6471–6482, 6684–6691 Dimension A = 32"
Engines 1405–1409 Dimension A = 33"



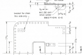
AGS 6689 at Birmingham, Alabama about 1947. Photo by P. E. Ardrey, Jr., from the collection of Richard E. Prince, Jr.



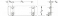
building the RARITAN

by William H. Morewood

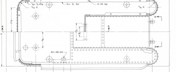
1. rivet the sides together; tin all joints on inside with soft solder
2. screw sides to bottom and solder inside
3. position the top and solder


tight fit on 3/32 dia pin
soft solder
#11 (.191) drill
silver solder
SECTION C-C
bracket for chain
this side only
C
C
1 7/8
1 1/8
1 3/4
2 1/4

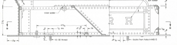
19-2 TANK TOP
Brass - 1 required


2 1/2
4-40 screw

SECTION D-D
Brass


1 3/4
6 3/4
1/16 x 3/8 strip
1/4 x 3/8 bar
4-40 tap
3/16 R
5/16 R
#11 (.191) drill
A
D
D
1 1/16
2 3/16
4 1/8
1 9/16
10 3/4

SECTION B-B AND TOP VIEW


60°
1/32 thick brass
soft solder
silver solder
1/2 dia
10-32 thread
bolts from holes in #8-5
B
B
R
R

19-1 TENDER TANK
Brass - 1 required

SECTION A A AND SIDE VIEW

T800

HEADING THE "FAST MAIL" IN 1886 — With every good wish for Christmas, etc. — **C&O Vauclain Compound**

T802

HOLIDAY JOURNEY — May the Peace and Happiness of the Christmas Season, etc. — **1900 New England Local**

T852

FROSTED STEAM — Merry Christmas and a Happy New Year — **Trio of K-36, 3 footers, Cumbres Pass, Colo.**

T803

GREEN FLAGS FOR A CHRISTMAS RUN — May the meaning of the Season be deeper, etc. — **20th Century Lt'd.**

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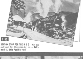
T100

STATION STOP FOR THE B & O — May you and yours this Christmas day, etc. — **Baltimore & Ohio Pacific type**

T954

RUNNING LATE AND RUNNING FAST — May you and yours this Christmas day be blessed, etc. — **84 Broadway Lt'd.**

T509

FRESH TREES AND FULL STEAM — Best Wishes at Christmas and through the New Year — **"Mogul" narrow gauge**

T951

CLIMBING KICKING HORSE PASS — Best wishes for a Merry Christmas and a Happy New Year — **Canadian Pacific 5934**

T800

CHRISTMAS MORNING RUN — May the meaning of the Season be deeper, as Christmas comes, etc. — **SP Overland Lt'd.**

T953

THE CHIEF ROLLS WEST — Peace and Good Will at Christmas, etc. — **Santa Fe 2900 Series, Victorville**

T512

HEADIN' WEST TO LARAMIE — Merry Christmas and a Happy New Year — **Union Pacific's "Big Boy"**

T224

HEADED FOR TROUT CREEK PASS — Merry Christmas and Happy New Year — **Colorado Midland, South Park 1898**

T925

NIGHT RUN IN THE ROCKIES — May the Spirit of Christmas be with you, etc. — **Rio Grande 3577 Mallet**

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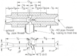
by Joseph F. Nelson

CHAPTER 14

BRAKES



1 7/32
1/4
1/4
7/32
7/32
1/8
1/4
steam
1/4 - 40 pipe thread
3/16 tubing to train line
exhaust
3/16 pipe thread
1/2
3/8
#73 drill

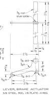
STEAM EJECTOR

5/16 HEX BRASS

1 3/4
7/8
5/8
3/16
3/32 drill
3/16 R.
3/16 R.
3/32 drill
10-32 N.F.
3/8
1
1 3/16
1/8
approx. 2 1/2

CLEVIS, BRAKE ADJUST

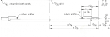
1/2 DIA. BRASS ROD - 4 REQD



3/8 rod
silver solder
2 1/8
4 1/8
2
2 1/8
1/8
1/2
2 1/2
3/8 drill
3/8 R.
1/8 drill
3/16 R.
3/16 R.
2
2 1/8

LEVER, BRAKE ACTUATOR

3/8 STEEL ROD, 1/8 PLATE - 4 REQ.

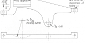


1/16 chamfer both ends
5/32 drill
silver solder
silver solder
1 5/8
1
1/4
3 5/8
4 7/16
9/16
5/16
1/2

1/4
1/8
2
1 7/16
5/32 drill
1/4 drill
3/16 R. both ends

BRAKE HANGER ARM

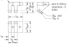
STEEL - 8 REQUIRED



1 1/2 approx.
drill 6-32 N.F. clearance - 2 holes
3/8 drill
3/4 5/32 milling cutter

VACUUM CYLINDER HANGER BRACKET

CAST ALUMINUM - 4 R.H. AND 4 L.H. REQD.



1/2 R.
drill 5-40 N.C. clearance - 2 holes
3/16 drill
3/8 R.
1 1/4
1/4
1/2

BRAKE HANGER

CAST ALUMINUM - 4 R.H. AND 4 L.H. REQ.

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BLS NATIONAL MEET SCHEDULED FOR 1972!

The Pioneer Valley Live Steamers will host a National Meet of the Brotherhood of Live Steamers at their track in Southwick, Massachusetts on October 6, 7 and 8, 1972 in conjunction with the Twentieth Anniversary of that club's formation.

Brenton W. Bamfather, Secretary of the PVLS, announced the meet, mentioning that it will also come at the peak of the fall color season. Dinners will be scheduled for both Friday and Saturday nights with a World Travel Lecture on one evening and a Railroad Night on the other – giving the women a chance at a respite from steam, steam, steam! There is plenty of space for parking cars and campers as well as near-by motels and additional details will be announced as time goes on.

Although it falls out of the pattern of five-year schedule of previous BLS National Meets, there is much in favor of the 1972 date; In addition to the 20th Anniversary for the Pioneer Valley Live Steamers, it is also the 40th Anniversary of the founding of the Brotherhood of Live Steamers!

We'll all look forward to this meet and will be waiting to hear of more of the details.

7TH ANNUAL EXPOSITION OF STEAM

The Gold Coast Railroad will hold its 7th Annual Exposition of Steam on Saturday, November 21st, 1970 from 11:00 a.m. to 5:00 p.m.

All persons owning full size or model steam or gas engines of any type are invited to bring them to the show and place them on exhibit. Admission is free to all.

Gold Coast Railroad is located at the intersection of S.W. 9th Avenue and S.W. 34th Street in Fort Lauderdale, Florida, and their full-size Pacific #153 will supply steam and air for operation of displays.

JT&S RR CLUB CALLS FOR MEMBERS

The Joshua Tree & Southern Railroad Club, planning to start laying 15" gauge track this fall, is now enrolling members interested in building and operating narrow gauge engines and equipment in 5" scale, 15" gauge.

Only regular members who have helped to plan, build and operate the club's track and museum will be entitled to run, station their individually-owned equipment in the roundhouse or serve on operating crews. Regular Membership is offered on an invitational basis. Rail or Live Steam fans who wish to lend support may become Associate Members upon making a tax-deductible contribution of $12 or more to the JT&S Museum.

For more information, contact Joel Tedder, 4241 E. Live Oak Ave., C 7, Arcadia, CA 91006.

NJLS OFFICERS ELECTED

At their meeting on April 19th, the New Jersey Live Steamers voted to keep incumbent, Joel Beecher, as president, David Wojtowicz as vice president and treasurer and Ralph Green as secretary.

John Muldowney and Walter Kleinfelder were elected to succeed themselves on the Board of Directors.

GGLS SPRING MEET WELL ATTENDED

Thirty-three engines were operating on the Golden Gate Live Steamers' track on the 13th and 14th of June to provide plenty of activity for the Live Steamers in attendance. There were many visitors from faraway places who stayed on after their visit to the BLS National Meet in Los Angeles to attend the GGLS Spring Meet, and some operated their equipment on the GGLS track.

A picnic supper on Saturday night featured Earl Chanda's beans which, we understand, are worth the trip alone!

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WILLIAM MUSTER
PRESIDENT

Dear Friends:

The fate of the Delta Queen will be decided in a few days. Your help is needed now!

The U. S. Senate has amended the Maritime Bill to include an exemption for the Delta Queen so she may continue as America's last overnight steamboat. Since the House has already passed its version of this Bill, it will now go directly to a Conference Committee where a few individuals will decide our future in secret session. The merits of our case may be secondary to the politics of compromising the differences between the House and Senate versions of the Maritime Bill.

The Department of Interior officially lists the Delta Queen in the National Register of Historic Places--they are thereby committed to preserve the Delta Queen. But the Department of Transportation, which supervises the Coast Guard, is committed to put us out of business. Our hope is that President Nixon will intervene and settle the conflicting objectives of his two cabinet departments.

It would only be necessary for the Coast Guard or the Department of Transportation to admit that the Delta Queen does not encounter the same risks as an ocean vessel on the high seas and that the Delta Queen's automatic sprinkler and other safety precautions are a significant deterrent to a fire.

You can help. Write President Nixon a post card, a short note or a telegram. He and most other members of Congress have heard our arguments--though they all haven't listened. They've even seen the petitions and appeals from thousands of private citizens and 18 state Governors.

Your personal appeal to President Nixon may help us get a fair hearing. We hope you will do it today before an inappropriate law ends a great tradition of river steamboating in America.

Sincerely,
GREENE LINE STEAMERS, INC.

William Muster
William Muster

September 8, 1970

WM/js

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Scheduled Meets

October

3
4 SOUTHERN MINNESOTA LIVE STEAMERS
At O'Neil's track
3½" – 4¾" – 12"
Lake City, Minnesota

9
10
11 PIONEER VALLEY LIVE STEAMERS
3½" – 4¾" – 7½"
Royston W. Dandaflen, Secretary
3 Fleetwood Drive
Sandy Hook, Conn. 06482

17 LIVE STEAM EXCURSION
CSLC Railroad
Cadillac, Michigan
See ad for details

November

21 SEVENTH EXPOSITION OF STEAM
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Joe Bryant, Secretary
1330 Scott Street
El Cerrito, California 94530

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1st Sunday each month
3½" – 4¾" – 7½"
Joel Corbin, Secretary
13723 Kittridge Street
North Hollywood, Calif. 91606

MID-SOUTH LIVE STEAMERS
Nashville Chapter
2nd Tuesday every month
7½" gauge
Harry Wade
5540 Granny White Pike
Brentwood, Tennessee
615 – 373-0138

MONTREAL LIVE STEAMERS
1st Sunday of each month
3½" – 4¾" – 7½" gauges
S. H. Galloway, Secretary
53 Brentwood Road
Beaconsfield, Quebec, Canada

NEW JERSEY LIVE STEAMERS
Every Sunday May through October
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Ralph W. Cronk, Secretary
840 Kilsyth Road
Elizabeth, N. J. 07208
Phone 201 – 353-4424

PACIFIC NORTHWEST LIVE STEAMERS
Every Sunday May through October
4¾" – 7½" gauge
Route 2, Molalla, Oregon
H. S. Harvey
1425 S. E. Flavel Street
Portland, Oregon 97202

PENNSYLVANIA LIVE STEAMERS
Sept. 20, Oct. 4 & 18
William H. Scott, Secretary
R.D. 1, Box 400
Sellersville, Pa. 18960

PIONEER VALLEY LIVE STEAMERS
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3½" – 4¾" – 7½"
Royston W. Dandaflen, Secretary
3 Fleetwood Drive
Sandy Hook, Conn. 06482

RAILROADERS CLUB OF SAN ANTONIO
3rd Sunday each month,
weather permitting
7½" gauge
Cas Dock
2626 McCullough Avenue
San Antonio, Texas 78212

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Every Sunday, weather permitting
May 24th through October 18th
2½" – 3½" – 3" gauges
Ted L. Crawford, Secretary
1110 H. 2nd Street
P. O. Box 517
Colton, California 92324
Phone 714 – 825-3005

RIVERSIDE LIVE STEAMERS
4th Saturday-Sunday each month
Hunter Park-Iowa & Columbia Ave.
Riverside, California
Engine House Phone 714 – 683-7628
Francis H. Smith, Secretary
4536 Dewey Avenue
Riverside, California 92506
Phone 714 – 688-9533

SOUTHERN CALIFORNIA LIVE STEAMERS
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mail stop

DC&H RR

That center photo (in the July issue) is really great! It doesn't take much imagination to blow up the scale to 12" = 1' and put myself right there on the track in some quiet little town of a long-gone era.

JERRY BROWN
5839 HUBBARD STREET
CULVER CITY, CA 90230

WOULD-LIKE-TO-SEE DEPARTMENT

I must say that I enjoy LIVE STEAM *Magazine* very much; even though it's small, it's all meat. When it arrives, I read it with the fervor of a starving chicken pouncing on a kernel of corn.

Let's have more items like *Crickett, Omaha Live Steam, Riverboat Wren*, and articles covering equipment and layout of amusement parks, etc., featuring Live Steam. They have a special appeal to mechanically inept steam buffs like myself.

EDDIE SCHUHARDT
P. O. BOX 1288
PORT ARTHUR, TEXAS 77640

BAKER VALVE GEAR DETAILS

I like Baker Valve Gear and thought I knew quite a bit about it until I started to lay it out. So far I have drawn it 1/12, 1/8, 1/3, 1/4 and near half full size and have copied direct information on NYC Hudsons, Canadian National, Locomotive Cyclopedia, Baker Hand Book, Yoder & Wharen on valve gear, Peabody information and other information from generous Live Steamers like Mr. A. C. Otto of Sandwich, Illinois. I have even talked long-distance to the Pilliod Company.

Result: I find a boo-boo in the design that I can't account for and can find no published or verbal information to explain it. I am referring to the fact that the valve travels farther back of center position than it does forward. (Offset in the combination lever usually accounts for angularity in the valve rod – not unequal valve travel.) I have found out that this was also true on the big jobs and that the rear valve port was longer than the front port so that cut-off would occur at approximately the same percentage position.

In small locomotives the difference is very small or negligible, but I want to know how to correctly lay out the gear!! I have my own solution but am not sure how the prototype designers did it. Pilliod says they haven't made one in over 15 years and I don't like to annoy the only man left there who knows anything about it. (He's been with the company 50 years!) Engineering time costs more than I care to pay.

Maybe one of the Live Steamers has the necessary information.

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